

## Space Weather: A Philatelic Journey *from Don Hillger and Garry Toth*

The American Topical Association (ATA), an association devoted to topical philately, published in DVD format in early December 2017 its Handbook 166-E: Space Weather: A Philatelic Journey. It was written by two meteorologists, Garry Toth and Donald Hillger. The handbook's images and checklists are taken from their Space Weather web page <http://rammb.cira.colostate.edu/dev/hillger/spacewx.htm>. Interested readers are invited to consult that page.

This short article describes briefly the content of the handbook and presents examples of its philatelic illustrations. It then presents details related to the DVD and how to order it from the ATA, along with information about a potential printed copy. Those interested in a printed copy are invited to express their interest to the ATA. If enough people are interested, a printed copy will be produced.

### Part 1 What is Space Weather?

Certain types of large solar storms emit large numbers of energetic particles and electromagnetic energy which travel outward through space in a burst that greatly strengthens the solar wind (a "river" of particles and energy constantly flowing outward from the Sun). In some cases that burst of energy strikes Earth and near-Earth space, with impacts on humans (such as astronauts) and their technology (such as satellites, communications and navigation systems, and electrical distribution networks). Space weather is the study of such physical processes and their impacts.

### An Example of Space Weather Impacts at Earth's Surface

On 9 March 1989, an intense solar storm exploded and blasted away from the Sun. Energy raced outward, and three and a half days later, at 0244 EST on 13 March, Earth was struck by a severe geomagnetic storm, one of the strongest of the modern era. In addition to satellite anomalies, it caused brilliant auroras that were visible at much lower latitudes than normal, and disrupted HF radio communications and LORAN navigation. The storm was so strong that it also had effects down to Earth's surface. Intense electrical currents in the atmosphere induced currents at the ground in some locations. Hydro-Québec has very long transmission lines at northern latitudes, and electrical currents induced in them caused transformer failures and a catastrophic collapse of the power distribution network. The blackout

lasted for nine hours and affected some six million people in the province of Québec. The northeastern USA came close to losing power as well. Following this event, electrical utilities companies, especially those in high latitude locations, had to implement strategies to reduce the risks associated with such geomagnetically-induced electrical currents.

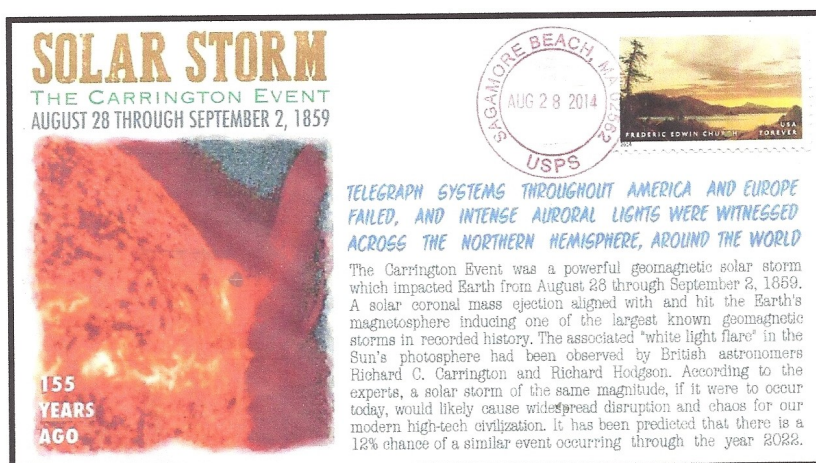
### Space Weather Forecasting

NOAA's Space Environment Center (SEC) and the US Air Force jointly operate the Space Weather Prediction Center (SWPC; see <http://www.swpc.noaa.gov/>) that provides real-time monitoring and forecasting of solar and geophysical events and issues space weather watches, warnings and alerts to users in government, industry and the general public.

### Part 2

### Space Weather: A Philatelic Journey: Sample Content

The handbook describes the history of scientific studies related to space weather, from the earliest observations of the auroras and Earth magnetism through Earth-based solar and space studies to modern measurements by balloons, rockets and satellites. Space weather impacts are also examined in detail. Some information on other planets such as Mars is also included. The subject is presented in a philatelic context, and the handbook is extensively illustrated with postage stamps and other philatelic items. Here and opposite are a few examples taken from the handbook...



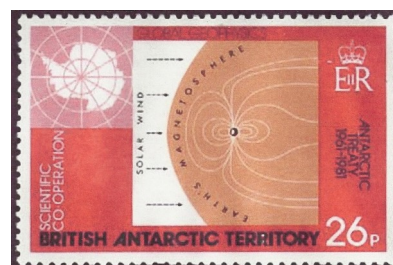
Philatelic cover describing the "Carrington Event", the first major solar storm observed scientifically that had significant impacts on Earth.





American space scientist James Van Allen and the satellite Explorer-1. (Data from this satellite and others that followed led to the discovery of the Van Allen radiation belts that lie above the Earth).

Below: A diagram of Earth's protective magnetosphere and the solar wind that continually strikes it.



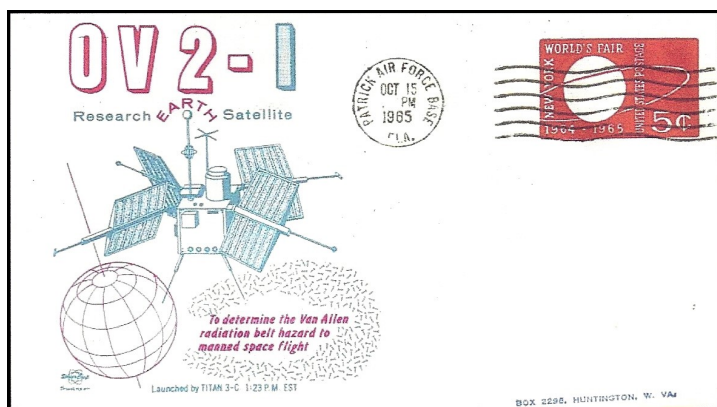
Yohkoh solar observatory with major solar storms in the background



Solar wind experiment set up on the Moon by Apollo 11 astronaut Buzz Aldrin



Rocket research and auroras



OV2-1 satellite, "to determine the Van Allen radiation belt hazard to manned space flight"



Above right: Space Disturbance Laboratory and Space Disturbance Forecast Services (precursor of the modern NOAA Space Weather Prediction Center)



Auroras on Saturn

Right: MAVEN satellite (in orbit around Mars, measured the rate of loss to space of the Martian atmosphere which is being stripped away by the solar wind)





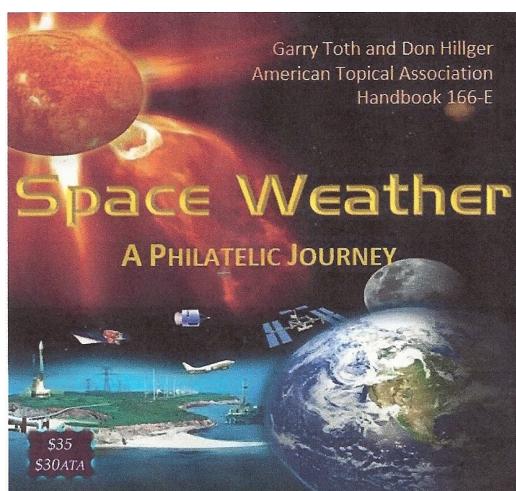
### Part 3 Space Weather:

A Philatelic Handbook: Web Radio Interview One of the authors (Toth) was interviewed about space weather and the handbook by the web radio station wsRadio.com. The interview can be found at <http://wsradio.com/110817-weather-whetherliterature/> in two parts: "Weather in Space?" and "How Does Space Weather Affect Us?".

### Part 4 Space Weather: A Philatelic Journey

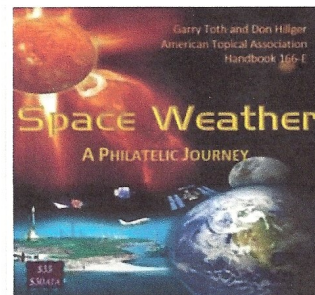
DVD and Ordering Information, and Printed Copy Information

The DVD



## Space Weather Handbook DVD Released by ATA

Solar storms that cause bright auroras can also affect people and technology in space and on Earth. The development of the scientific understanding of that Sun-Earth relationship is examined in *Space Weather—A Philatelic Journey*, a new philatelic handbook published in DVD format by the American Topical Association.



Written by meteorologists Garry Toth and Don Hillger, it contains descriptive text, stamp and cover images, and an extensive and up-to-date checklist. More than 200 pages of detailed information are in .pdf format. The checklist appendices in Excel format are also included.

The handbook will be of interest to collectors of numerous space and weather-related topics.

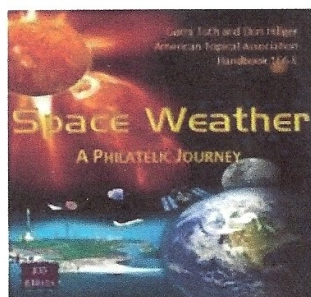
Garry Toth, MSc, was an operational meteorologist with the Meteorological Service of Canada. His topical interests are weather, climate, space weather and planetary weather.

Don Hillger, PhD, is a satellite meteorologist with the National Oceanic and Atmospheric Administration and holds a cooperative position at Colorado State University. His topical interests include unmanned scientific satellites, weather and climate.

The DVD is \$35, or \$30 for ATA members, plus \$1.50 postage in the U.S.\* and Canada, or \$3 elsewhere. Order from American Topical Association, PO Box 8, Carterville, IL 62918-0008, [americantopical@msn.com](mailto:americantopical@msn.com). Preorders will be taken for a printed book version until Mar. 31, 2018.

## Introducing ATA Handbook 166-E

### Space Weather - A Philatelic Journey



Currently offered ONLY in DVD format,\* this beautifully written E-book, authored by meteorologists Garry Toth and Don Hillger and published by the American Topical Association, discusses in detail the relationship between solar events and their impact on space and earth through text, postage stamp and cover images, and documented with a checklist of stamps and covers.

Topical interests covered in this handbook include (but are not limited to):

Astronomy, Cosmology, Meteorology, Astrophysics, Chemistry, Human Spacecraft, Oceanography, Earth Sciences, Hydrology, Volcanology, etc.

**ORDER YOURS TODAY** by mailing a US bank check to ATA or sending an email to [americantopical@msn.com](mailto:americantopical@msn.com) and requesting Space Weather, ATA Handbook 166-E

Cost: \$35 (\$30 for ATA Members) + \$1.50 for shipping within the US/Canada or \$3.50 to other countries

Above . Information Published by The Virtual Stamp Club, at <http://virtualstampclub.com/lloydblog/?p=6203>

Left and below: Information published by the ATA, in its publication *Topical Time* (Jan-Feb 2018 issue) (including printed copy information at the bottom)

\* You are going to want to add this to your collection. ATA is currently taking pre-orders and *interests* in possibly purchasing a PRINT version of *Space Weather - A Philatelic Journey*. If this is you, we would like to hear from you. Please send an email to [americantopical@msn.com](mailto:americantopical@msn.com) to share your desire to have a print version for your collection. Or if you need help in making up your mind, email us to see a few sample pages of this colorful E-book. We just know you're going to love it!

See page 36 for related item

